Zero Retries issue 0151 2024-05-10

Zero Retries is an independent newsletter promoting technological innovation that is occurring in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Now in its third year of publication, with 1600+ subscribers.

About Zero Retries

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

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Web version of this issue - https://www.zeroretries.org/p/zero-retries-0151

Request To Send

Commentary by Editor Steve Stroh N8GNJ

Paid Subscribers Update

My thanks to **Prefers to Remain Anonymous 30** for becoming a Paid Subscriber to Zero Retries this past week!

Financial support is a real vote of confidence for continuing to publish Zero Retries.

Major Conference Countdowns

- **Hamvention 2024** in Xenia, Ohio, USA on 2024-05-17 thru 19, in *01* week!
- **HAM RADIO 2024** in Friedrichshafen, Germany on 2024-06-28 thru 30, in *04* weeks!
- **JARL Ham Fair 2024** in Tokyo, Japan on 2024-08-24 and 25, in *15* weeks!

See other events at the Zero Retries Guide to Zero Retries Interesting Conferences.

Presentation to RATPAC 2024-05-08

I did a presentation to the Radio Amateur Training Planning and Activities Committee (RATPAC) weekly videoconference earlier this week. My slide

deck was titled:

Tracking Technological Innovation in Amateur Radio - Zero Retries Newsletter.

There were… 20? folks on the live videoconference, but RATPAC's YouTube channel has 6.2k subscribers, so it's likely that the "watched" count will grow from the current (as I write this) 36 views. I'm grateful that RATPAC posted the video to YouTube so quickly.

This presentation was a good "backgrounder" about Zero Retries, but my closest advisors have advised me that I should do "more pictures, less text". The longer suggestion was that the topics I discuss in presentations are "front of mind for me", but to explain to others, visuals are more helpful than plain text.

Thus, point taken, my future slide decks will be better illustrated. As I did with the LinuxFest Northwest slide deck, I'll annotate this one with links and then get it to RATPAC for posting with the video.

Other "Recent" Interviews and Presentations

In adding these two most recent presentations to my QRZ page - I updated other "recent" interviews and presentations:

- 2021-04-26 - Plutopia News Network - Steve Stroh: Broadband Access
- 2021-12-08 - FLOSS Weekly 659 - Open Source and Amateur Radio
- 2023-11-25 - QSO Today Podcast - Episode 477 - Steve Stroh - N8GNJ
- 2024-05-04 - LinuxFest Northwest 2024 - Amateur Radio and Open Source (Not Just Linux)
- 2024-05-08 - RATPAC - Tracking Technological Innovation in Amateur Radio - Zero Retries Newsletter

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In the Meantime…

The heavenly weather - bright sun, temps in the 70s, very light breeze, has returned to Bellingham, just in time for a Mother's Day weekend trip to Portland, Oregon to reunite my daughter Merideth KK7BKI and my wife Tina KD7WSF… and to spoil the grand*cats* (and Tina) just a little bit.

73,

Steve N8GNJ

Leave a comment

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What's New at Digital Library of Amateur Radio & Communications

By Kay Savetz K6KJN
Zero Retries Pseudostaffer

There's so much new stuff in the DLARC library this month! I hardly know where to begin.

The Manuals Plus scanning project is complete!! (Well, *for now!*) Four pallets of radio and radio-adjacent manuals are completely scanned, online, searchable, and downloadable: 4,294 manuals in all. (In February I estimated the lot would be about 4,000 manuals. My guess wasn't too far off. I also estimated the project would take six weeks, which turns out was optimistic.) The batch includes manuals for wonderfully esoteric hardware, a majority of which I bet had little to no reliable information online until now. Please explore the collection. Maybe there's a manual for an obscure gadget that's in your ham shack.

Do you want more manuals like these to be scanned? We can make it happen, with your help. Internet Archive has many more pallets of unsorted manuals just waiting to be scanned. You can help get them to the scanning center. We've negotiated a situation where, if money is donated, the remaining manuals can be sent for scanning without us having to pre-sort them like we did for the first four pallets. DLARC will fund the scanning of manuals that overlap with our mission, and plenty of non-radio manuals will be scanned too. If you want to help, here is a special donation link. If you're in the U.S., donations are tax deductible.

The other Big News Item is the new DX-peditions collection. The California Historical Radio Society contributed all sorts of material documenting DX-peditions from the early 1960s through the mid 1990s. The media they sent included videotapes, cassette tapes, 35mm slides, and one reel-to-reel tape.

The videotapes went to my colleague Jason, who digitized all 60-plus of them. These little trip documentaries are provide fascinating glimpses into far-off places and long-gone people. Look at all those old cars, planes, and radios! Meanwhile, I handled the audio: four dozen recordings about trips to Kingman Reef, Pitcairn Islands, Burundi, the Galapagos, and all manner of other far-flung locales.

Yes, I handled the reel-to-reel tape, which turned out to contain a fascinating account by Frank Turek DL7FT (SK) about DX-peditions he made from 1963 to 1975. The 35mm slides (many of which are meant to accompany the audiotapes) haven't been digitized yet; we hope to be able to scan them sometime this summer. (As you might imagine, properly scanning thousands of slides takes specialized equipment and processes.)

A tangent: snuck in with the DX-pedition videotapes are a few off-topic but very cool videos worth checking out: here's A Message from Barry Goldwater K7UGA, a short interview with the opinionated, radio-loving senator. And, take a minute to watch Pile Up Busters, a playful parody of Ray Parker Jr.'s "Ghostbusters" theme.

Another update — I had written in February that we had 84 books in the Radio Books from MIT Libraries collection — public domain books and journals about radio that were donated to DLARC by MIT libraries and scanned by us. I thought that collection was complete — until the folks from MIT asked if we wanted scans of another 25 books: books that are so rare or fragile that the librarians thought it wasn't a good idea to ship them, so they scanned them there. These new additions of old books include The Maintenance of Wireless Telegraph Apparatus (1918), Wireless Apparatus Making: a practical handbook on the design, construction, and operation of apparatus for the reception of wireless messages (1923), and several items in French and German.

Let's talk radio conferences: DLARC has added material from the emcomm-focused Comm Academy and ham-focused Pacificon.

Comm Academy (originally called Communications Academy) was a free training conference for people interested in developing emergency communications skills. The first Communications Academy took place in 1998. Based in the Pacific Northwest, Comm Academy was primarily a regional event organized by the Western Washington Medical Services Emergency Communications team. Over the years, it gained a reputation as one of the West Coast's premier emergency communications training events. The final Comm Academy event was held April 2022. This conference ran for an impressive two decades, and DLARC now has more than 400 items from the entire span of the show, including PowerPoint presentations, papers, and video recordings of some talks. There is amazing material that we can all learn from here, all full-text searchable. As I was uploading the items and adding the metadata, a few jumped out at me, including Captain Andy Stevermer's 2007 presentation "Pandemic Response - Would Communications Make a Difference?" and Carolyn Driedger's 2012 talk "Preparing for Future Volcanic Eruptions — Mt. St. Helens Lessons Learned" … (Kay types, worriedly watching the [active, but *currently* dormant - Ed.] volcano visible outside the window.)

DLARC has added material from Pacificon, an annual amateur radio convention produced by the Mount Diablo (California) Amateur Radio Club. The collection includes schedules and flyers for the show going back to 2011, videos of some presentations, some slide decks. (The 2024 Pacificon show will be October 18-20 in San Ramon, California. I hope to be there.)

I've continued the hunt for lost audio treasures in the TAPR Software Library CD-ROMs (1996, 1997, and 1998) and boy howdy are there some gems! I want to send bouquets of flowers to whoever recorded those talks so well and then put them on CD-ROMs so that I could find them nearly 30 years later. I don't even hold a grudge against them for making me convert the files from RealAudio format to MP3.

Here's a circa 1987 interview about packet radio with Lyle Johnson WA7GXD, co-founder of TAPR. Here's audio of 14 talks from the 2002 Digital Communications Conference, including sessions about software defined radio and Direct Digital Synthesis. Here's a handful of presentations from the 6th Annual TPRS Fall Digital Symposium, presented by the Texas Packet Radio Society in December 1997. Here's audio from several sessions from HamCom 1996 Digital Forum, including DXng by Packet, and "how to step up to 9600 bps easily and inexpensively." And here's audio from some sessions at TAPR Digital Forum at Dayton Hamvention 1996, which includes a talk by Phil Karn KA9Q called "A High-Performance Satellite Modem for the PC." Listen to them all! Read the transcriptions! The past is the future.

Finally: as soon as I heard the news that MFJ would be winding down, I updated DLARC's MFJ library with new manuals, newsletters, and videos from their YouTube channel.

And lest you forget, here's that special donation link that will help us get more pallets of obscure manuals scanned. The Internet Archive and DLARC thank you.

Digital Library of Amateur Radio & Communications is funded by a grant from Amateur Radio Digital Communications (ARDC) to create a free digital library for the radio community, researchers, educators, and students. If have questions about the project or material to contribute, contact me at kay@archive.org.

Kay Savetz K6KJN is the Internet Archive's Program Manager, Special Collections… the curator of the Digital Library of Amateur Radio & Communications project.

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Logo courtesy of National Telecommunications and Information Administration.

US NTIA "Open Radio" Innovation Awards Available

By Steve Stroh N8GNJ

"Open Radio Innovation", they say? There are numerous Amateur Radio open source projects could qualify as "Open Radio" innovation, with a little bit of creativity and chutzpah.

Biden-Harris Administration Announces $420M Funding Opportunity to Promote Wireless Equipment Innovation

> Today, the Department of Commerce's National Telecommunications and Information Administration (NTIA) announced that up to $420 million in funding will be made available to build the radio equipment needed to advance open network adoption in the U.S. and abroad.

…

> This second round of funding targets two critical areas:
>
> - Open radio unit commercialization: Accelerating the development of open radio units to the point where they meet the needs of wireless carriers and are ready for commercial trials; and
> - Open radio unit innovation: Improving the overall performance and capabilities of open radio units through targeted research and development.
>
> NTIA expects to grant between $25 million and $45 million per commercialization award, and $5 million to $10 million per innovation

award. Applications are due July 10.

I forwarded this to a company I thought might be interested in pursuing such an opportunity. I outlined the potential synergies that I saw, and the response was… they didn't really "get it". I suggested that "Improving the overall performance and capabilities of open radio units through targeted research and development." could be interpreted to include land mobile two-way radio systems, such as repeaters and other "narrowband" infrastructure. Although "radio systems" has come to mean mostly cellular / mobile systems, and some satellite systems, there is still considerable use of land mobile two-way radio systems including public safety and especially law enforcement. Thus NTIA might be persuaded to "broaden their definition" of radio systems to two-way radio systems. Though "commercialization" might be a big leap for my ideas below, I'll guess that these ideas could qualify for an (or multiple) "innovation awards".

Amateur Radio Open Source Projects Could Qualify as a Basis for an NTIA Innovation Award

Amateur Radio is one of the few sources of any significant innovation in land mobile two-way radio technology (we *try new things*!) since 12.5 and 6.25 kHz channels were mandated decades ago now and necessitated the use of digital voice techniques.

Some examples:

- M17 Project - An entire *Open Source* two-way radio ecosystem that includes digital voice, text messaging, repeaters, Internet linking, protocols, and young enough and still flexible enough (again, open source…) to go beyond existing two-way radio paradigms for a modest investment in focused developer resources.
- The M17 Project's Remote Radio Unit - UHF repeater mounted on a tower, including duplexer, so no expensive, lossy coax / hardline running down a tower to the radio.
- Repeaters that can accommodate multiple Digital Voice and data modes through use of the Multi Mode Digital Voice Modem (MMDVM).
- Opulent Voice and Codec 2 - *Modern*, open source CODECs for Digital Voice
- Single frequency repeaters using Time Division Multiple Access (TDMA) techniques. Such a repeater would listen on one time slot, and transmit on the other time slot. This concept was implemented in a Hytera Digital Mobile Radio portable repeater for emergency use, so there's some prior art to this. The benefit of this approach is that it radically simplifies a repeater; no duplexer is required since there is only one frequency involved. Such an approach "doubles" the available number of repeaters in a given band. New Packet Radio implements TDMA, so single frequency fast transmit / receive switching is apparently doable.
- ka9q-radio creates a "receive all channels" capability and its creator Phil Karn KA9Q speculates that it could be used for a mobile "voting" receiver for a simulcast repeater network. ka9q-radio could perhaps be extended into a pseudo trunking system, with more of the intelligence in the vehicle / user radio than in the network.
- Use Single Sideband (SSB) for VHF / UHF two-way radio for *3 kHz* channels. We now have very capable, inexpensive Software Defined Transceivers (SDTs) that can easily and flexibly generate, and automatically tune SSB signals. SSB exceeds the current "narrowband" requirement of 6.25 kHz channels, and work being done with FreeDV offers good voice quality over narrow bandwidths, and it's now easily implemented with SDTs. Perhaps it's time to try to build such a system for VHF / UHF and repeaters.

Those are just a few ideas that I think could qualify as "open radio units through targeted research and development" per NTIA. I hope some company in the Amateur Radio market *will be bold enough to apply* for an NTIA Innovation Award.

Applications are due 2024-07-10.

Leave a comment

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ZR > BEACON

By Steve Stroh N8GNJ

Short mentions of Zero Retries Interesting items.

Island Magic B.B. Link - Bluetooth Low Energy / Bluetooth Classic Adapter

Island Magic B.B. Link Adapter - Image courtesy of Island Magic Co.

Meet B.B. Link, the adapter that connects iPhones and iPads to Kenwood TH-D75 and D74 radios. With it, iOS applications like RadioMail can fully utilize the radio's built-in KISS TNC packet modem. Plug it into the USB-C port of the phone, turn your radio on, and you're set.

Features

- Pair with the radio once, and the adapter will remember it. It automatically reconnects whenever the radio is on and within range.
- Automatically identifies the correct VFO for data connections and switches the radio to KISS TNC mode when an app connects.
- Allows applications like RadioMail to change frequencies as needed.
- Automatically returns the radio to its previous frequency and mode once you're done.
- Comes with a handy lanyard to keep your adapter within easy reach.
- Over-the-air firmware updates using the B.B. Link Configurator app.
- Flexible open source firmware.

Compatibility

- This adapter only works with certain Kenwood radios, iOS devices and apps. Double-check you've got the right gear. You'll need:
- An iOS device with a USB-C connector, like the iPhone 15 or newer iPad models listed here
- A Kenwood TH-D74 or TH-D75 radio

A packet application like RadioMail or APRS.fi that complies with the BLE KISS TNC specification

This… is one1 elegant approach to the long quest2 to do reasonable data, either chatting or email, using an Amateur Radio portable radio and a handheld device with a reasonable screen and keyboard (a modern mobile phone). It would have been more elegant for Kenwood to "get with the 2020s" in their design of the TH-D75A (released in 2023, thus the Bluetooth issues were hardly a surprise to Kenwood) and support the *modern* Bluetooth Low Energy specification. For the minor cost of the B.B. Link and powering it, problem solved.

Status Update on Connect Systems M17 Portable Radios

Email from Connect Systems (no web page to link to):

> **STATUS OF M17**
>
> The follow is the status of the M17 project as reported by the developer.
>
> Hi Jerry,
>
> I'm sending you the new document, with the updated modification to the mic path and a description of the reasons for the changes.
>
> I'm not against having my name mentioned, if you want to do so. :)
>
> Silvano Seva
>
> About this project
>
> There are two people primarily responsible for the development of the M17 project.
>
> Silvano Seva who is the primary person for the firmware and

Wojciech Kaczmarski who is the primary person for the hardware.

If there are other people involved, I am sure I will hear about it and will include it in future blogs.

Link to Modification (PDF File)

Supporting This Project

We are asking the amateur community to buy in advance one or more of the radios. When the radios are available, you will be the first to get them at a discount from the standard price of the radio. If at anytime you decide you would rather not support this project, you can get your money back and then get in the back of the line for when the radios are released.

Link to Support CS7000 M17 PLUS

Link to Support CS7000 M17

The CS7000 M17 page states that the expected availability of these radios is "late May, 2024". Again, kudos to Jerry Wanger KK6LFS for this bold measure of support for M17.

T41 Presentation - With a Zero Retries Interesting Teaser

Link above is for a .odp (PowerPoint) file.

Feature set:

- 5 band HF 80, 40, 20, 15, 10M
- 20W, CW - SSB (Fuzzy QRP)
- Self-contained, no PC, laptop, tablet, or phone needed
- Large spectrum/waterfall display
- No touch display – FFS
- Luggable
- Reasonable cost
- Open Source on both hardware and software

I found my way to this interesting HF Software Defined Transceiver project via a brief mention on a mailing list of the associated low cost 100 watt amplifier project (see details in the presentation).

But the Zero Retries Interesting angle was that Slide 56 had this intriguing mention:

- K9HZ Boards (For T41 and any QRP Radio)
- VHF-UHF Boards
- All Ham Bands 220 MHz - 2.4 GHz
- Under development by KI3P and K9HZ
- True SDR. I/Q Outputs and Inputs

While I found lots of references to K9HZ's making printed circuit boards of the T41 widely available, I didn't find anything about the "KI3P / K9HZ VHF-UHF Boards".

The Modern Ham - Recent Zero Retries Interesting Articles

I admire Billy Penley KN4MKB of the Modern Ham YouTube channel for his coverage of Zero Retries Interesting subjects. Not only does he produce Zero Retries Interesting videos, he also provides good written equivalents on his blog TheModernHam: Modern take on electronics and RF Engineering.

While videos give you a good overview of a subject, the details can easily be lost. KN4MKB's articles provide that level of detail so you can truly follow along on his software projects.

KN4MKB has been busy of late with these Zero Retries Interesting articles:

- How to Secure your Packet BBS / BPQ32 or LinBPQ Instance
- BBS Botnet – The Packet Radio Cybersecurity Crisis in Ham Radio
- Install and Configure LinBPQ BBS Packet Node on Debian Ubuntu and Raspbian
- APRS on Linux with YAAC (Yet another APRS Client) and Direwolf

And a few others since beginning his Modern Introduction to Packet Radio, AX25, APRS and TCP/IP series in March. One of my projects for Summer

2024 is to get a Radio Bulletin Board System (RBBS) online in my area; almost certainly a BPQ32 BBS, thus these articles are timely for me.

Note that there is an option of receiving a monthly summary of articles via email.

Raspberry Pi Connect - Built-in Remote Access for RPi 4 / 5 (64-bit only)

> Today we're pleased to announce the beta release of **Raspberry Pi Connect**: a secure and easy-to-use way to access your Raspberry Pi remotely, from anywhere on the planet, using just a web browser.
>
> It's often extremely useful to be able to access your Raspberry Pi's desktop remotely. There are a number of technologies which can be used to do this, including VNC, and of course the X protocol itself. But they can be hard to configure, particularly when you are attempting to access a machine on a different local network; and of course with the transition to Wayland in Raspberry Pi OS Bookworm, classic X remote desktop support is no longer available.
>
> We wanted to be able to provide you with this functionality with our usual "it just works" approach. Enter Raspberry Pi Connect.
>
> … Raspberry Pi Connect needs your Raspberry Pi to be running a 64-bit distribution of Raspberry Pi OS Bookworm that uses the Wayland window server. This in turn means that, for now, you'll need a Raspberry Pi 5, Raspberry Pi 4, or Raspberry Pi 400.

This is pretty cool. As I understand it, a Raspberry Pi (organization) server(s) on the Internet is *queried for every connection attempt*, even if you're attempting to connect between two RPis on a LAN. It seems to me it a lot more efficient to attempt an equivalent broadcast on a LAN, and only if that's *not* successful, connect to a server on the Internet. I could easily see this being a valuable teaching tool.

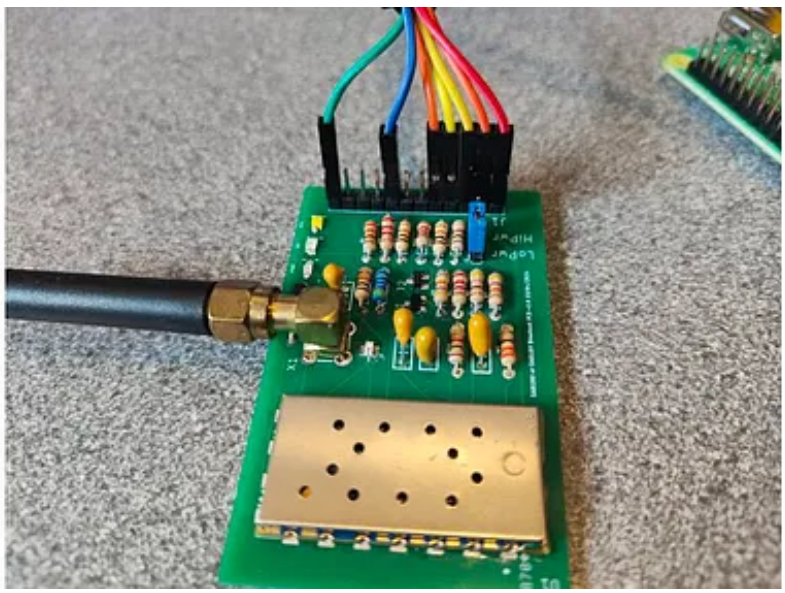
Anduril Announces Pulsar Family of AI-Enabled Electromagnetic Warfare Systems

> Anduril Industries is excited to announce Pulsar, a first-of-its-kind family of modular, multi-mission-capable electromagnetic warfare (EW) systems that utilize artificial intelligence at the tactical edge to rapidly identify and defeat current and future threats across the electromagnetic spectrum, including small and medium-size drones.
>
> Dominance of the electromagnetic spectrum is critical to operations on a modern battlefield of rapidly-evolving drone, counter-drone, and jamming technologies. As the war in Ukraine has shown, EW tactics are evolving faster than ever — a cat and mouse game of sensing and dodging, disruption and adaptation, in the spectrum — with updates to EW and threat systems now happening over shorter timelines of weeks, days, or even hours. The next generation of EW systems must enable real-time understanding of the spectrum, and provide rapid delivery of effective countermeasures against known and new threats, across domains and modalities.
>
> That is precisely what Pulsar does.

Electronic warfare (EW) has "downscaled" radically because of command and control of drones, and thus EW is now in the tactical realm, hence the need for this product.

A guess on my part is that applicants who are Amateur Radio Operators may well rise quickly to the top of Anduril's hiring queue. Amateur Radio might be considered "old school" to some, but hands-on experience with radio technology is now *bleeding-edge relevant*.

Hobby PCB's SA818 (DRA818) Breakout PCB - $10



SA818 (DRA818) Breakout PCB - Image courtesy of Hobby PCB / Tindie

What is it?

This is a breakout Printed Circuit Board for a SA818 transceiver module.

Why did you make it?

I am a licensed Radio Amateur and building electronics is part and parcel of the culture. I have wanted to construct a radio using this module for some time and successfully built the shield for an OrangePi zero published by VoltNode. A great design but designed exclusively for the OrangePi. I wanted to be able to interface any MCU to make programming the module easier, hence the PCB here.

What makes it special?

It is a very simple low cost design, that can be controlled by RaspberryPis, Arduinos and Pico's etc.

At $10 (via Tindie), this opens up “radio tinkering” with these widely used radio modules to a whole new audience of experimenters. Note that this item is *just the printed circuit board (PCB)*. This is made clearer on the seller’s website for this item. I think it’s a bit… *confusing*… to show this item with components installed, which is not what is being offered. But for $10, that’s a minor quibble.

DeepRad - Catch some radio waves with this modular RTL-SDR system

DeepRAD Quad Board - Image courtesy of DeepSea Developments / Crowd Supply

From Crowd Supply:

> DeepRad is a modular version of the RTL-SDR, a product beloved by radio enthusiasts. However, DeepRad offers distinct advantages. Its

> modularity makes integration far simpler, side-stepping the complexities of designing an RTL-SDR from scratch (such as RF considerations and chip stocking issues). DeepRad is a versatile option for integrating many different radio functions into whatever projects you're working on today.
>
> We want the community to create their own "motherboards" with 1, 3, or as many as 20 DeepRad modules to bring new applications to life. There are three versions of DeepRad we'll be focusing on for this campaign:
>
> - DeepRad Module: The bare DeepRad module (no motherboard). The user has to develop a board to use it.
> - DeepRad Single: A single DeepRad module with a motherboard. It has USB Type-C and an antenna connection. It can be used as your regular RTL-SDR with USB.
> - DeepRad Quad: A motherboard with 4 DeepRad modules integrated via a USB hub with a USB Type-A connector.

Though this isn't even at the crowdfunding stage, let alone an actual product, the concept has legs. KrakenSDR is a project with similar scope, integrating five software defined receivers into a single unit on the same timebase and USB chain, and it seems to be pretty popular for a variety of applications. Thus being able to have as many as twenty such modules (hopefully relatively inexpensive), has even more potential applications.

May-June 2024 SARC Communicator Journal

> Heading into summer...
>
> With another big issue. The May-June 2024 Communicator, digital periodical of Surrey Amateur Radio Communications is now available for viewing or download.
>
> Read in over 150 countries, we bring you 120 pages of Amateur Radio content from the Southwest corner of Canada and elsewhere. With less fluff and ads than other Amateur Radio publications, you will find Amateur Radio related articles, projects, profiles, news, tips and how-to's for all levels of the hobby.

I consider the Communicator a newsletterzine - 120 pages! I consider the quality of the content to be excellent, never mind that it is written, edited, and published by volunteers. The editor mentioned that each issue requires about 40 hours of work. If you miss the general content of CQ or QST (sans contest results), the Communicator is an excellent replacement, and like Zero Retries and other "in *service* to Amateur Radio" publications, it's available for free and publicly accessible. Recommended!

Stuff You Should Know - Atomic Clocks, Ahoy!

> … for everything to operate correctly tech forward world, it has to be synchronized, right, and you can't synchronize something unless everybody agrees on what time it is. And that's all an atomic clock is. It is very simply, and we'll get into the how these things work, which sounds difficult, but it's actually pretty simple.

My daughter Merideth KK7BKI got me hooked the Stuff You Should Know podcast. I don't listen to every episode (often as I'm settling down to sleep), but I listen to at least half of their episodes, and all that involve technical subjects (such as Space Stations). In my opinion, the two hosts are pleasant to listen to and do a credible job of research and work hard to accurately and understandably explain what they learn. From this episode I learned why Cesium is used as the basis for most atomic clocks.

(SYSK's Ham Radio and the Hams Who Use Them episode has some funny moments.)

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Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out
Join the Fun on Amateur Radio for some pointers.

Zero Retries Frequently Asked Questions (FAQs) — In development 2023-02.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing ***Thanks*** to:

- Tina Stroh KD7WSF for, well, *everything!*
- ***Founding Members*** **who generously support Zero Retries financially:**
  Founding Member 0000 - Steven Davidson K3FZT
  Founding Member 0001 - Prefers to Remain Anonymous 01

Founding Member 0002 - Chris Osburn KD7DVD
Founding Member 0003 - Don Rotolo N2IRZ
Founding Member 0004 - William Arcand W1WRA
Founding Member 0005 - Ben Kuhn KU0HN
Founding Member 0006 - Todd Willey KQ4FID
Founding Member 0007 - Merik Karman VK2MKZ
Founding Member 0008 - Prefers to Remain Anonymous 14
Founding Member 0009 - Prefers to Remain Anonymous 19

- Numerous Annual and Monthly subscribers who also generously support Zero Retries financially!

Want to Support Zero Retries?

- The *most* effective way to support Zero Retries is to simply mention Zero Retries to your co-conspirators that are also interested in knowing more about technological innovation that is occurring in Amateur Radio and encourage them to become a fellow subscriber.
- One particularly effective method of promoting Zero Retries is to add a mention of Zero Retries to your QRZ page (or other web presence) and include a link:

  https://www.zeroretries.org

- If you'd like to financially support Zero Retries, becoming a paid subscriber is *greatly* appreciated and helps offset expenses incurred in publishing Zero Retries. Paid subscriptions for Zero Retries are *entirely optional*, as explained in this special issue of ZR:
  Zero Retries Administrivia - Activating Payment Options.

These blogs and newsletters regularly feature Zero Retries Interesting content:

- Dan Romanchik KB6NU mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- Jeff Davis KE9V also mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- Amateur Radio Weekly by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories.
- Experimental Radio News by Bennet Z. Kobb AK4AV discusses (in detail) Experimental (Part 5) licenses issued by the US FCC. It's a *must-read-now* for me!
- RTL-SDR Blog - *Excellent* coverage of Software Defined Radio units.
- TAPR Packet Status Register has been published continuously since 1982.
- Other Substack Amateur Radio newsletters recommended by Zero Retries.

These YouTube channels regularly feature Zero Retries Interesting content:

- HB9BLA Wireless by Andreas Spiess HB9BLA
- KM6LYW Radio by Craig Lamparter KM6LYW (home of the DigiPi project)
- Modern Ham by Billy Penley KN4MKB
- Tech Minds by Matthew Miller M0DQW

Zero Retries is currently using the Substack email publishing platform to publish Zero Retries. It's particularly suitable for small newsletters as you can get started for no cost.

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Leave a comment

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Social Media:

Zero Retries (N8GNJ) is on Mastodon — n8gnj@mastodon.radio — just click:

Zero Retries / N8GNJ on Mastodon

Zero Retries (N8GNJ) is also on Bluesky — @n8gnj — just click:

Zero Retries / N8GNJ on Bluesky

Email issues of Zero Retries are "instrumented" by Substack to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- SuperPacket blog — *Discussing new generations of Amateur Radio Data Communications — beyond Packet Radio (a precursor to Zero Retries)*
- N8GNJ blog — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs — Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ / WRPS598 (He / Him / His)
These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham (The City of Subdued Excitement), Washington, USA, and linked to the Internet via **Starlink *Satellite* Internet Access**.

2024-05-10

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1

Two other approaches to using a mobile phone as a terminal to work with an Amateur Radio portable radio, is the Mobilinkd TNC4 and the DigiRig Mobile.

Then there's the even more elegant approach of the PicoAPRS V4 which is a "*data is primary*" Amateur Radio portable radio.

2

The Kenwood TH-D7A, which debuted in 1998, was the first (that I'm aware of) Amateur Radio portable radio to include data capability.